

Abstract

In this project we will (a) adapt to tropical areas the quasi-operational subseasonal excessive heat outlook system (SEHOS) that currently covers the United States, and (b) enhance SEHOS by using forecasts of temperature and humidity from multiple operational subseasonal prediction models. This project will result to a unified SEHOS covering all geographical areas of interest to NOAA and will extend the forecast horizon to week-4.

In previous work by the PI, we developed a subseasonal excessive heat outlook system for the contiguous United States and Alaska (SEHOS-US). This work was done in collaboration with NOAA's Climate Prediction Center (CPC). Currently this system is based on the NCEP Global Ensemble Forecast System (GEFS) and its accompanying reforecast conducted by NOAA's Earth System Research Laboratory (ESRL). It provides realtime experimental forecasts of the probability of occurrence and intensity of heat events during forecast Week-2. This system will enter in its experimental operational phase (Technical Readiness Level 7) in late spring 2016.

Heat waves also affect subtropical and tropical areas. NOAA's mission includes prediction of potential hazards related to climate, weather and hydrological events across the global tropics thus supporting various sectors of the U.S. economy (finance, energy, agriculture, water resource management) that have foreign interests. This objective is carried out by the Global Tropical Hazards and Benefits Outlook (GTH) which is a CPC operational forecast product that highlights areas favored for enhanced or suppressed precipitation and regions where chances for tropical cyclogenesis are elevated for, currently, the upcoming Week-1 and Week-2 time periods. The proposed project will enrich the GTH by adding an excessive heat event outlook component for the subtropics and tropics (SEHOS-STROP) in its catalogue of products.

At this time the SEHOS-US uses output from only the GEFS and focuses on forecast week-2. There is room for growth as multiple model operational forecasts of temperature and humidity extending to Week-3 and 4 are provided in realtime to CPC. Currently, the PI is conducting research for combining multi-model ensemble forecasts for the SEHOS-US under a NOAA Climate Test Bed funded project. The second phase of the proposed project will adapt findings from the aforementioned research to develop a multi-model, Week-3 to 4 SEHOSSTROP.

This project will test, optimize and extend to the tropics and subtropics techniques developed for subseasonal forecasting of excessive heat events in the United States. This project will accelerate transition to operations of a unified subseasonal outlook system for excessive heat events which will cover all geographical areas of interest to NOAA. This new tool will inform decisions facilitating mitigation thus being highly relevant to NOAA's strategic programmatic and to the current MAPP/CTB call.